

AD-A138 524

INVESTIGATIONS OF MICRO-TURBULENCE IN THE BOTTOM OF THE 1/1  
BOUNDARY LAYER(U) SCHMITT (RAINER) GLASHUTTEN (GERMANY  
F R) R SCHMITT JUL 83 DAJA45-83-C-0038

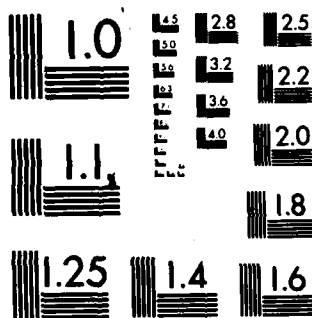
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MICROCOPY RESOLUTION TEST CHART  
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Investigations of Micro-Turbulence  
in the Bottom of the Boundary Layer

First Interim Report

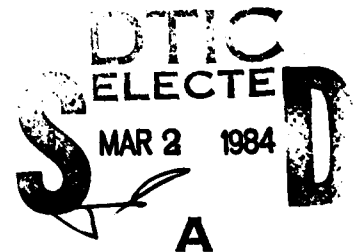
Dr. Rainer Schmitt

July 1983

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United States Army

London England



CONTRACT NUMBER : DAJA 45-83-C-0038

Dr. Rainer Schmitt

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number) Several sites for the taking of optical turbulence measurements in West Germany have been selected, and the specifications of supporting meteorological instru- mentation has been defined. Done		

This report is submitted later than date agreed on page 6 of the contract. The contractor had expected the delivery of the scintillometers in June 1983. The instruments from the Departement of the Army, White Sands Missile Range are now expected in August 1983

This short first interim report deals with the activities that have been conducted to facilitate the immediate start of the measurements after implementation of the scintillometers into the system.



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## 1. Locations of measurements

According to our proposal two locations have been selected:

1. Location in the plain area of northern Germany  
Area of the airfield of VERDEN  
(Air field Verden/Scharnhorst)  
52:57 North, 9:15 East ( Gauss - Krüger : 3518,5870 )  
Hight : 40 m MSL
2. Location in a hilly area  
Rural area of STEINBACH  
49:50 North, 9:26 East ( Gauss - Krüger : 3532,5504 )  
Hight : 400 m MSL

For orientation :

- Map No.1 : Map of the Federal Republic of Germany
- Map No.2 : L 3120 Verden
- Map No.3 : L 6322 Wertheim

Both locations are suitable for the kind of measurements that are planned, we have the permission of the owners of the territories. Electrical power is available.

## 2. Instrumentation

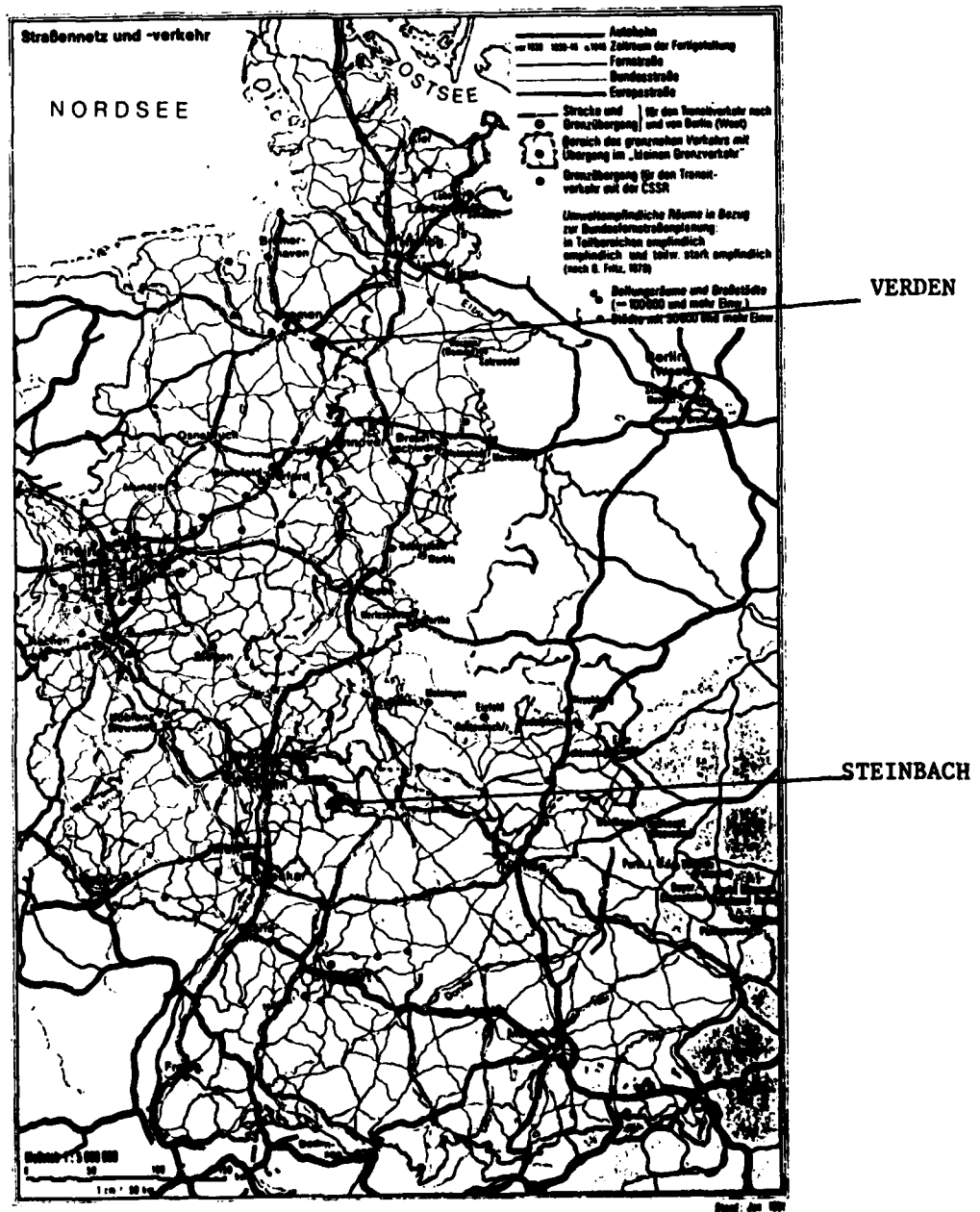
### 1. Meteorology

The following systems have been installed and tested:

- Wind Velocity and Wind Direction
- Temperature and Dewpoint using a electrical ventilated aspiration psychrometer
- Atmospheric pressure using a aneroid box set with electrical transmission of pressure signal.
- Radiation using a pyranometer for separate measurements of global and reflected radiation. Spectral region: 0.3 to 60 microns.

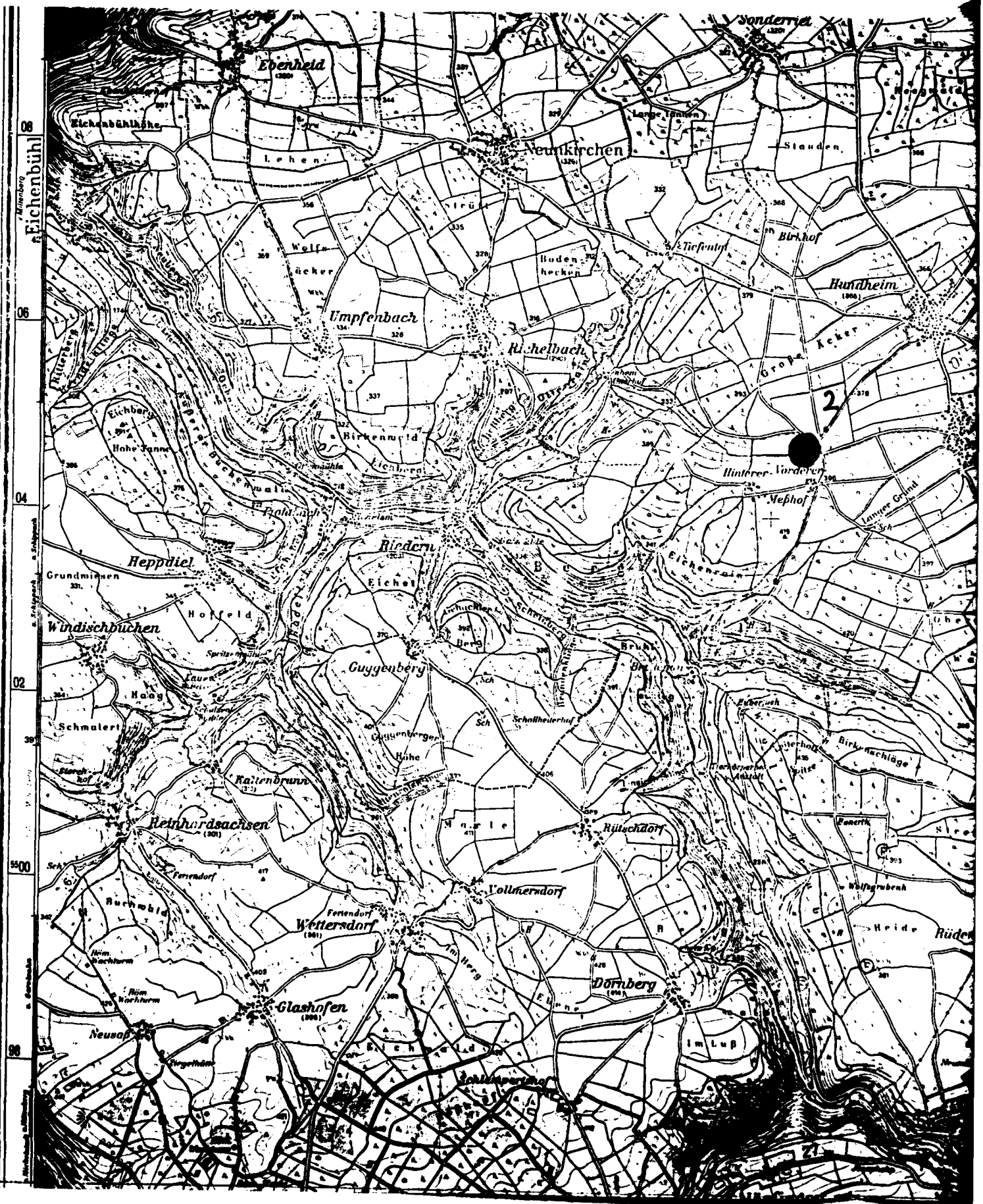
The wind measuring system is mounted at the top of a 3.5 m pylon, the other transmitters are installed at a height of two meters above ground.





Locations of measurements in West-Germany











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## 2. Data acquisition

All signals including two signals of the scintillometers are recorded via a Hewlett & Packard data acquisition unit HP 3421 A on a magnetic tape of a HP 9915 A modular computer. In dependence of the desired precision of the measurements the cycle-time for the 8 components is approx. 5 seconds. Using the individual data, 15-minutes-mean-values are calculated and stored on magnetic tape including standard deviation, maximum and minimum value of the period. The program can be modified to slightly faster scanrates if desired.

In addition to the on-site measurements of the meteorological parameters the weather-situation will be described using air - mass - characteristics defined by SCHERHAG (1949) for Europe, European weather maps published by the German Weather Service and upper-air data from the radiosonde-station Hannover, West Germany.

The data will be plotted versus time using HP 9845 B and transferred to HP 8" - Diskets and finally to 9-track tape.

- \* It should be checked if the ATMOSPHERIC SCIENCE LABORATORY \*
- \* could accept 8" discettes using standard IBM 3740 format. \*
- \* These discs are cheaper and more simple to handle for \*
- \* transportation \*

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Data of actual measurements:

MICYYMMDDHHMPPPTT.Ttt.t-FF.Fff.fDDDDdd.dVV:Vvv.v-RRRrrr1.11x.xx2.22y.yy  
 123456789012345678901234567890123456789012345678901234567890  
 ( ==> Zero up to 80 characters)

MIC	:	code for actual measurements	
YY	:	Year	
MM	:	Month	
DD	:	Day	
HH	:	Hour	( GMT )
MM	:	Minute of start of the period	
PPP	:	atm. Pressure	(Pascal)
TT.T	:	Temperature	(Celsius)
	- :	Temp. below Zero	
tt.t	:	Standard deviation of Temp	(Celsius)
FF.F	:	Dewpoint Temperature	(Celsius)
ff.f	:	Standard deviation of Dew Point Temp	
DDD	:	Wind-direction	(Degree)
ddd	:	Standard deviation	
VV.V	:	Windvelocity	(m/s)
vv.v	:	Standard deviation	
RRR	:	Radiation Balance	
rrr	:	Standard deviation	
1.11	:	Scintillometer signal No. 1	(Volts)
x.xx	:	Standard deviation	
2.22	:	Scintillometer signal No. 2	(Volts)
y.yy	:	Standard deviation	

\*\*\* Invalid or lost data are characterized by : 9999

